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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,028	10/31/2003	David Sikharulidze	1509-467	7131

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EXAMINER	
HON, SOW FUN	
ART UNIT	**PAPER NUMBER**
1772	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/698,028	SIKHARULIDZE, DAVID	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17-27* is/are allowed.

6)☐ Claim(s) *1-16* is/are rejected.

7)☒ Claim(s) *28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

New Allowable Subject Matter

1. Claims 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest cited prior art of record, US 5,357,358 in view of US 5,729,320, fails to teach or suggest, even when further in view of US 6,549,256, US 6,515,649 and US 5,729,320, the combination of:

(i) A bistable liquid crystal display device comprising: two cell walls enclosing a layer of a composition comprising nematic liquid crystal material and finely divided solid particles dispersed therein, at least one of said cell walls being translucent; at least one electrode on each of said cell walls for applying an electric field across at least some of said liquid crystal material; a first surface alignment on an inner surface of one of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a first orientation, and a second surface alignment on an inner surface of the other of said cell walls for inducing adjacent molecules of said liquid crystal material to adopt a second orientation which is different from said first orientation; said nematic liquid crystal material being arranged so it has a first stable molecular configuration in response to a first unidirectional electric field of a first direction, suitable magnitude and duration being applied across said electrodes and a second stable molecular configuration in response to a second unidirectional electric field of a second direction,

said second configuration being different from said first configuration, the first and second directions being opposite to each other; and drive electronics for applying the electric fields to the electrodes, the electric fields and the cell walls being such that (a) the first surface alignment is always homeotropic while the electric fields are applied to the electrodes, and (b) the second surface alignment is planar in response to the electric field extending in the first direction, and switches to homeotropic in response to the electric field switching from the first direction to the second direction; or

ii) A bistable liquid crystal display device comprising: two cell walls enclosing a layer of nematic liquid crystal material, at least one of said cell walls being translucent; said liquid crystal material having finely divided solid particles dispersed therein, said particles having sizes in the range 1 to 500 nm; at least one electrode on each cell wall for applying an electric field across at least some of said liquid crystal material; a first surface alignment on an inner surface of one cell wall for inducing adjacent molecules of said liquid crystal material to adopt a first orientation; a second surface alignment on an inner surface of the other cell wall for inducing adjacent molecules of said liquid crystal material to adopt a second orientation; a structure for distinguishing between different optical states of said liquid crystal material; and drive electronics connected to said electrodes for applying DC electric fields to said liquid crystal material, a first of the fields having a magnitude, a first direction and duration to cause the liquid crystal material to have a first stable optical state, a second of the fields, having a magnitude, second direction and duration to cause the liquid crystal material to have a second stable optical state, the first and second directions being opposite to each other, the

first and second stable optical states differing from each other, wherein the drive electronics is arranged to cause the electric field lines to be such that (a) the first surface alignment is always homeotropic while the electric fields are applied to the electrodes, and (b) the second surface alignment is planar in response to the electric field extending in the first direction and switches to homeotropic in response to the electric field switching from the first direction to the second direction.

Allowance Repeated

2. The allowance of claims 17-27 is repeated for the same reasons previously of record in the Office action dated 07/19/06.

Rejections Repeated

3. The provisional obviousness-type double patenting rejections of claims 1-27 over SN 11/075,255 and SN 11/114,449, are repeated for the same reasons previously of record in the Office action dated 07/19/06.

4. The 35 U.S.C. 103(a) rejections of claims 1-16 over Durand in view of Eidenschink, as the primary combination of references, are repeated for the same reasons previously of record in the Office action dated 07/19/06.

Response to Arguments

5. Applicant's arguments have been fully considered but they are not persuasive.

6. Applicant argues that Durand uses an electrooptical switching effect based on azimuthal switching provided by electrical polarization effects, and a display which has symmetrical alignment conditions, while Eidenschink uses nanoparticles and switches between transparent and light scattering states, so that they are [non-analogous] art and hence one of ordinary skill in the art would not combine them.

Applicant is respectfully reminded that Durand teaches a bistable liquid crystal display device comprising nematic liquid crystal (optical, abstract), and that Eidenschink also teaches a bistable liquid crystal display device (generating bistable images, column 2, lines 7-10, liquid crystalline medium in a display, column 2, lines 23-29) comprising nematic liquid crystal material (phase, column 7, lines 34-36). Thus, the two references are analogous art. Durand is the primary reference that teaches polarity-controlled switching (flexoelectrical polarization, abstract), and that ions and cholesteric particles are added to the nematic liquid crystal (doped, column 6, lines 55-60), for the purpose of providing different optical effects. Eidenschink is the secondary reference which teaches that, along with adding ions to the nematic liquid crystal (salts to produce electrohydrodynamic effects, column 4, lines 65-67), particles are added to provide a variation in the optical properties using the application of an electric field (column 1, lines 50-55, external influence, column 2, lines 15-22), such as light scattering (dispersions of particles, column 1, lines 50-57), thus providing the motivation to modify Durand.

7. Regarding claim 7, Applicant argues that in the Durand device, the liquid crystal molecules switch between azimuthally distinguished stable states in response to

opposite polarity pulses, while the present claim requires the molecules to switch between planar and homeoplanar [homeotropic] states.

Applicant is respectfully apprised that claim 7, as presently recited, does not require the liquid crystal molecules to switch between planar and homeotropic states, while new claims 28-31 do. Instead, present claim 7 only requires that the first alignment surface induce planar alignment and the second surface alignment induce homeotropic alignment. While the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

8. Applicant argues that the Eidenschink device is different from the Durand device because of the construction and the electro-optical effects thereof since the Eidenschink device switches between a light scattered state and a vertical transparent state, stabilized by a network of nanoparticles in the cell volume, with no indication of a charging effect of nanoparticles or electromigration [of nanoparticles] across the cell, and that furthermore, the Eidenschink device does not exhibit fully electrically controlled bistable switching.

Applicant is respectfully apprised that Durand is the primary reference that teaches fully bistable polarity-controlled switching (flexoelectrical polarization, abstract), and that Eidenschink is the secondary reference that teaches the addition of nanoparticles (12 nm, column 6, lines 54-55) to effect light scattering (dispersions of particles, column 1, lines 50-57), thus providing the motivation to combine as discussed above. In response to Applicant's argument that the references fail to show certain

features of Applicant's invention, it is noted that the features upon which Applicant relies (i.e., charging effect of nanoparticles and electromigration of nanoparticles across cell) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

9. Applicant argues that the use of polarizers with a scattering effect leads to a poor optical effect, so that one of ordinary skill in the art would not have modified the Durand device as a result of the disclosure in the Eidenschink patent to form a bistable device with an orientational effect that enables modulation of polarized light due to reorientation of the LC molecules between planar and vertical states.

Applicant is respectfully apprised that the features upon which Applicant relies (i.e., modulation of polarized light due to reorientation of the nematic liquid crystal molecules between planar and vertical states, note the terms "planar state" and "vertical state") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

10. Applicant argues that the Durand and Eidenschink patents describe different devices with different substrate geometries and different operational mechanisms, based on different electrooptical effects, and thus would not be combinable to attain the bistable nematic device of the present claims 1 and 16.

Applicant is respectfully reminded that Durand teaches a bistable liquid crystal display device comprising nematic liquid crystal (optical, abstract), and that Eidenschink

also teaches a bistable liquid crystal display device (generating bistable images, column 2, lines 7-10, liquid crystalline medium in a display, column 2, lines 23-29) comprising nematic liquid crystal material (phase, column 7, lines 34-36). Thus, the two references are analogous art. Durand is the primary reference that teaches polarity-controlled switching (flexoelectrical polarization, abstract), and that ions and cholesteric particles are added to the nematic liquid crystal (doped, column 6, lines 55-60), for the purpose of providing different optical effects. Eidenschink is the secondary reference which teaches that, along with adding ions to the nematic liquid crystal (salts to produce electrohydrodynamic effects, column 4, lines 65-67), particles are added to provide a variation in the optical properties using the application of an electric field (column 1, lines 50-55, external influence, column 2, lines 15-22), such as light scattering (dispersions of particles, column 1, lines 50-57), thus providing the motivation to modify Durand.

11. Regarding claim 14, Applicant argues that while the Durand device does switch polarized light and uses polarizers, one of ordinary skill in the art would not have used polarizers in combination with the Eidenschink device because the polarizers would cause light scattering, leading to reduced optical efficiency of the display.

Applicant is respectfully apprised that Durand is the primary reference that teaches the use of polarizers to distinguish between different optical states of the liquid crystal material (cell is observed between polarizers, column 6, lines 6-10), as acknowledged by Applicant, while Eidenschink is the secondary reference which teaches that, along with adding ions to the liquid crystal (salts to produce

electrohydrodynamic effects, column 4, lines 65-67), particles are added to the liquid crystal to provide a variation in the optical properties using the application of an electric field (column 1, lines 50-55, external influence, column 2, lines 15-22), such as light scattering (dispersions of particles, column 1, lines 50-57).

12. Regarding claims 7-8, Applicant argues that the Brown device is not bistable, and uses a liquid crystal with negative dielectric anisotropy necessary to allow the electric field to switch the liquid crystal molecules from homeotropic alignment to planar alignment, while Durand and Eidenschink use a positive liquid crystal, and hence Brown is not combinable with Durand and Eidenschink.

Applicant is respectfully apprised that claims 7-8, as presently recited, do not require the liquid crystal molecules to switch between planar and homeotropic states, while new claims 28-31 do. Instead, present claims 7-8 only require that the first alignment surface induce planar alignment and the second surface alignment induce homeotropic alignment, taught by Bryan-Brown (an aligning surface treatment at one cell wall providing substantially planar alignment, an aligning surface treatment on the second cell wall capable of providing a substantially homeotropic alignment, column 2, lines 21-28), for the purpose of obtaining a controlled twist device with improved viewing angle (column 2, lines 1-5), thus providing the motivation to combine with Durand in view of Eidenschink. While the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

01/05/07

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